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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,092	08/17/2001	Eiji Tani	212933US2X	3606
22850	7590	03/10/2006	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			CLEVELAND, MICHAEL B	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/931,092	<b>Applicant(s)</b> TANI, EIJI	
	<b>Examiner</b> Michael Cleveland	<b>Art Unit</b> 1762	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.  
     4a) Of the above claim(s) 2-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 6-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 2-5 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 8/11/2003.

### ***Claim Interpretation***

2. Claim 1 is a product-by-process claim. A product by process claim is limited only by the structure implied by the claims, not to the specific manipulations performed to obtain the product. The claimed product comprises a porous product containing A) silicon carbide as indicated by the preamble and the claim language "performing reaction-bonding of the porous structural to form silicon carbide having sufficient molten silicon wettability such that molten silicon penetrates into the porous structural body and to simultaneously form open pores by the reaction-bonding which decreases a volume of the porous structural body" and B) silicon as indicated by the claims language "to form a composite of silicon carbide and silicon having the porous structural body".

The remaining process limitations are not considered to imbue the claim with any further structure because it merely recites the preparation and infiltration of carbon-containing and silicon-containing components that may be reacted to form the silicon carbide-silicon composite.

### ***Claim Objections***

3. Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The nature of the decomposable precursor does not impart further structural limitations to the final product.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Luthra et al. (U.S. Patent 5,962,103, hereafter ‘103).

‘103 teaches a porous composite of silicon carbide and silicon (col. 4, line 63-col. 5, line 4).

6. Claims 1 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Hanzawa (U.S. Patent 5,851,941, hereafter ‘941).

‘941 teaches a porous composite of silicon carbide and silicon (col. 2, lines 28-31).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luthra et al. (U.S. Patent 5,962,103, hereafter ‘103) in view of Krenkel et al. (U.S. Patent 6,358,565, hereafter ‘565).

‘103 is discussed above. It teaches that the source of carbon may be from pyrolyzed carbon (col. 2, lines 43-49; col. 5, lines 32-40), but does not explicitly teach the use of a corrugated framework. However, ‘103 is open to the use of any form of pyrolyzed carbon, and ‘565 teaches that carbon fibers for carbon-containing composites may come from pyrolyzing sources such as cardboard (col. 3, lines 3-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used cardboard as the source

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for the carbon fibers with a reasonable expectation of success and with the expectation of similar results. '103 and '565 do not explicitly teach that the cardboard is corrugated. However, the Examiner takes Official Notice that corrugated cardboard is well known as stronger than ordinary cardboard. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used corrugated cardboard as the particular type of cardboard in order to have increased the strength of the composite.

### ***Double Patenting***

9. Applicant is advised that should claim 1 be found allowable, claims 6 and 7 will be objected to under 37 CFR 1.75 as being substantial duplicates thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Response to Arguments***

10. Applicant's arguments filed 1/9/2006 have been fully considered but they are not persuasive.

Applicant argues that the claims require the framework of a corrugated cardboard material. The Examiner notes that the claims recite "a framework" and require that the corrugated cardboard material is decomposized to form a carbonized composite having "the framework". However, there is no nexus that requires that the framework in question is the entirety of the corrugated cardboard. The language is open to considering any domain of the cardboard as the claimed "framework". Accordingly, the term "framework" does not imbue the claims with any significant structure. The Examiner further notes that claims 6 and 7 do not positively recite that corrugated cardboard is the particular material.

Applicant argues that corrugated cardboard has a significantly higher porosity, such as 90%. The argument is unconvincing because it is unsupported by evidence that corrugated cardboard has a porosity greater than 90% and other materials do not. The claims do not have any limitations which conclusively state any particular degree of porosity.

Applicant argues that claims 6 and 7 are allowable for the same reasons as claim 1. However, Applicant's arguments directed to claim 1 assert that a patentable difference is obtained through the use of a corrugated cardboard decomposable material. The argument is unconvincing for the same reasons given for claim 1 and further because neither claim 6 nor claim 7 positively requires that the decomposable material is corrugated cardboard.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Monday-Thursday, 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Michael Cleveland  
Primary Examiner  
Art Unit 1762

3/3/2006